



OBLON, SPIVAK, et al  
Docket No: 242890US8  
Inventor: Tatsuhiko UEKI, et al.  
Serial No: 10/662,521  
Reply to NFMP dated: April 28, 2004  
Replacement Sheet

FIG. 1

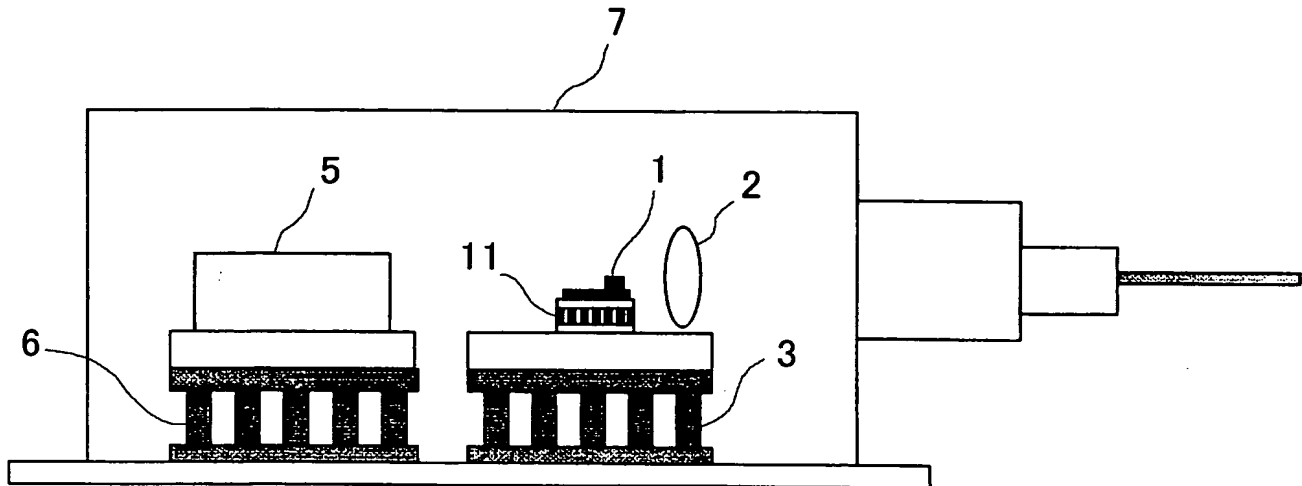


FIG. 2

|                          | Peltier substrate area S (mm <sup>2</sup> ) |     |      |       |        |        |
|--------------------------|---|-----|------|-------|--------|--------|
|                          | 2   | 4   | 8    | 16    | 32     | 64     |
| LD Heating value Q<br>mW | 150   | 75  | 37.5 | 18.75 | 9.375  | 4.6875 |
|                          | 250   | 125 | 62.5 | 31.25 | 15.625 | 7.8125 |
|                          | 360   | 180 | 90   | 45    | 22.5   | 11.25  |
|                          | 600   | 300 | 150  | 75    | 37.5   | 18.75  |
|                          | 800   | 400 | 200  | 100   | 50     | 25     |
|                          | 1000  | 500 | 250  | 125   | 62.5   | 31.25  |

FIG. 3A

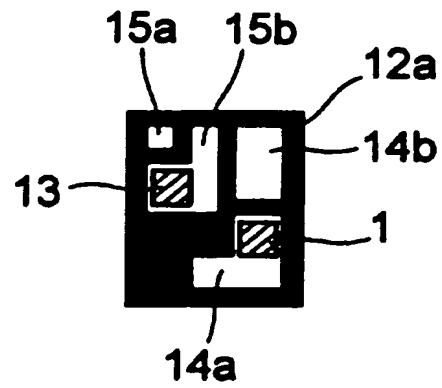


FIG. 3B

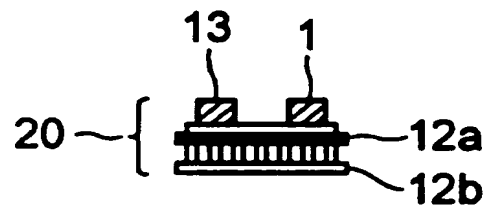


FIG. 3C

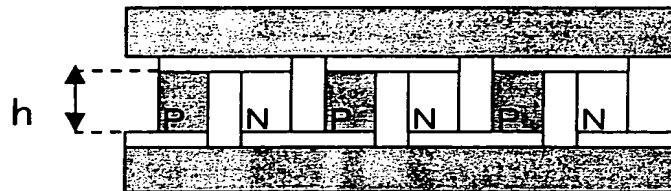


FIG. 4

|   | Symbol | Unit               | Example  |          |          |          |          |          |          |          | Comparative Example |          |  |  |  |
|---|--------|--------------------|----------|----------|----------|----------|----------|----------|----------|----------|---------------------|----------|--|--|--|
|   |        |                    | Config.A | Config.B | Config.C | Config.D | Config.E | Config.F | Config.G | Config.H | Config.I            | Config.J |  |  |  |
| ■ Ratio of element heating value to first substrate area                | Qd/S1  | mW/mm <sup>2</sup> | 55.56    | 55.56    | 32.61    | 160.00   | 55.56    | 52.08    | 7.50     | 20.00    | 7.03                | 20.83    |  |  |  |
| ■ Area ratio of first substrate to second substrate                     | S1/S2  |                    | 0.090    | 0.090    | 0.219    | 0.031    | 0.045    | 0.120    | 1.000    | 0.625    | 1.000               | 0.750    |  |  |  |
| ■ Mode coefficient of TEC   | F      | mm                 | 9.07     | 9.52     | 24.30    | 9.22     | 4.54     | 12.10    | 25.79    | 29.65    | 36.11               | 49.41    |  |  |  |
| ■ Area of first substrate   | S1     | mm <sup>2</sup>    | 6.48     | 6.48     | 18.40    | 2.25     | 3.24     | 8.64     | 48.00    | 30.00    | 64.00               | 48.00    |  |  |  |
| ■ Sum of chip bottom area   | Sc1    | mm <sup>2</sup>    | 1.81     | 4.76     | 8.51     | 0.92     | 0.91     | 2.42     | 19.60    | 15.12    | 27.44               | 25.20    |  |  |  |
| ■ Element heating value   | Qd     | mW                 | 360      | 360      | 600      | 360      | 180      | 450      | 360      | 600      | 450                 | 1000     |  |  |  |
| ■ Ratio of element heating value to sum of chip bottom area             | Qd/Sc  | mW/mm <sup>2</sup> | 198.41   | 75.66    | 70.55    | 390.63   | 198.41   | 186.01   | 18.37    | 39.68    | 16.40               | 39.68    |  |  |  |
| ■ Power consumption (ambient temperature of 70°C/LD temperature of 0°C) | W      | W                  | 2.50     | 2.50     | 4.00     | 2.10     | 2.00     | 3.50     | 5.00     | 5.50     | 5.50                | 9.00     |  |  |  |

FIG. 5

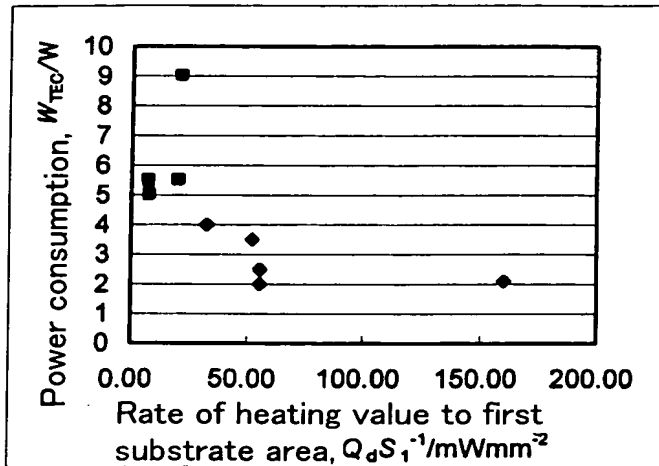


FIG. 6

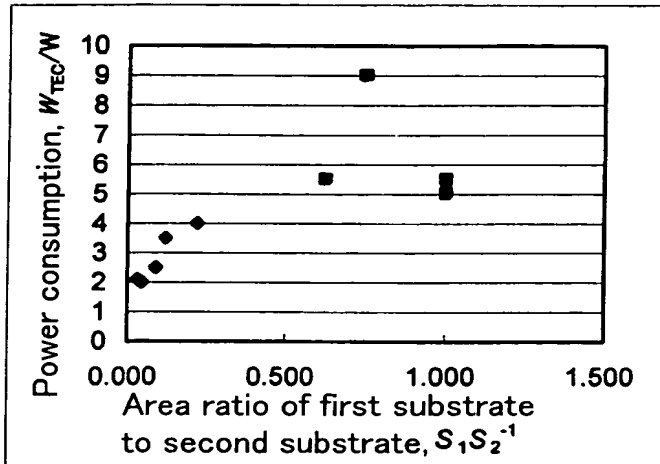


FIG. 7

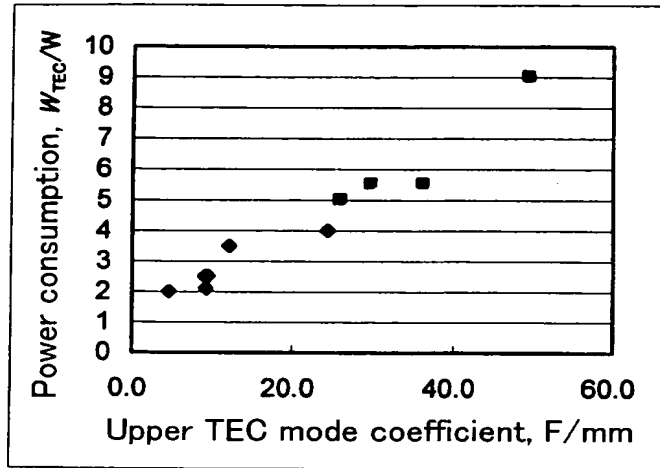


FIG. 8

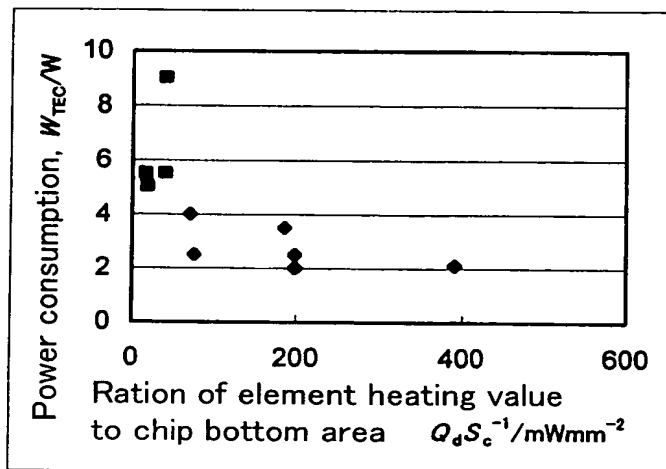


FIG. 9

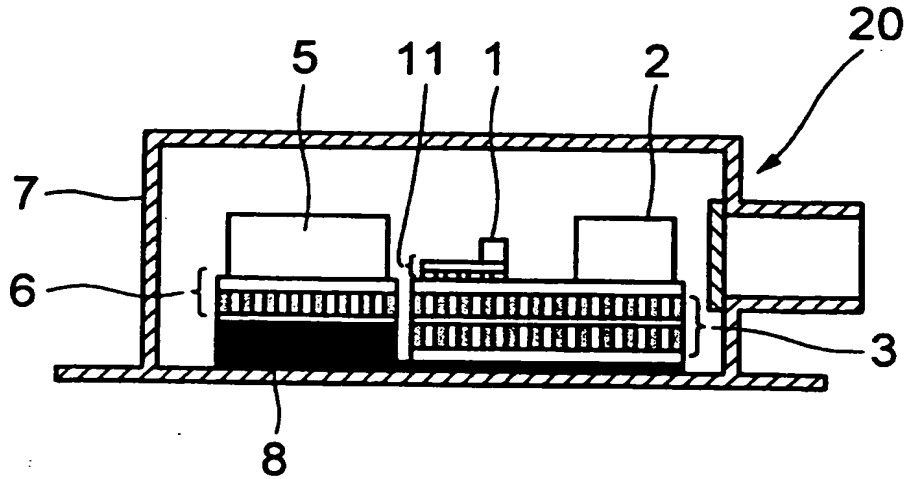


FIG. 10

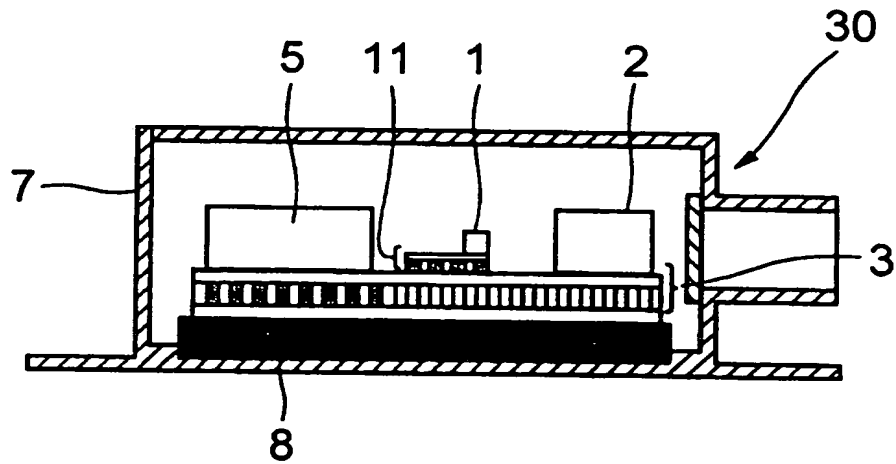


FIG. 11

